

NASA Resources for Educators

NASA Educational Materials

NASA publishes a variety of education resources suitable for classroom use. The following materials, specifically relating to the topic of aeronautics, are available from the NASA Educator Resource Center Network. Posters, lithographs, and some other printed materials are in limited supplies; the publication of new materials is ongoing. Contact the Educator Resource Center in your area, or NASA Central Operation of Resources for Educators (CORE), for the current list of available resources.

Videos

"Aeronautical Oddities."

Old news clips document the successes and failures of early aviation oddities including a windmill plane, flying barrel, spindle plane, tailless airplane, aerobike, ornithopter, sky-car, rocket glider and more.

"America's Wings."

Discusses aerodynamics and aircraft wing design. Includes commentaries from people whose contributions were historically significant in development of modern aircraft, including Igor Sikorsky, "father" of the helicopter; Kelly Johnson, designer of 40 aircraft including the SR-71, U-2, and F-104; NASA's Richard Whitcomb, who conceived the supercritical wing, the winglet, and the "Coke Bottle" fuselage; James Osborne, whose small suggestion helped make jet transports flyable; and Adolph Busemann, who contributed to the swept wing design.

"Flight Without Wings."

The history of the lifting body program, and its role in the development of the Space Shuttles, is told in this excellent segment that is centered around a flight by NASA research pilot John Manke in the wingless HL-10.

"Flying Machines."

Examines modern aviation and the technological advances that will impact aviation in the future. The tape briefly describes wind tunnels, power plants, safety, comfort, economy and noise abatement. NASA aeronautical research has answered some tough questions and is looking forward to solving current problems with creative innovations. Narrated by Cliff Robertson.

"A Man's Reach Should Exceed His Grasp."

Presents the story of flight and humankind's reach for new freedom through aviation and exploration of space. Voices of scientists and statements by writers, poets, and philosophers document man's search for knowledge. Narrated by Burgess Meredith.

"Milestones of Flight."

Produced by the National Air and Space Museum and based on the museum's "Milestones of Flight" gallery. It traces the history of flight from Langley's first attempts to the Space Shuttle, and uses film footage from many history-making events.

"Reduced Gravity Program."

Shows how NASA's KC-135 jet transport provides the scientific community with a weightless research environment. Highlights the types of experiments frequently conducted and explains how the "Weightless Wonder" creates a zero-gravity environment.

"Test Flights: Beyond the Limits"

Produced in cooperation with NASA Dryden Flight Research Center, this 3-part TV documentary series presents an entertaining and compelling story of the world of flight test and research. Each 47-minute video combines exciting aerial footage of unique research aircraft, and insightful interviews with pilots and engineers to tell the inspiring and sometimes dangerous story of flight research. Released in 1998, it is the newest and most comprehensive video of NASA flight research.

"Transformations of Flight."

An animated video that presents 10 important air and spacecraft in the history of flight. Serves as an intriguing invitation to explore the history of

aviation from the Wright Brothers' flight to the space shuttle program. A companion to the Transformations of Flight slide set also presented in this catalog. Produced by the Smithsonian Institution.

"The X-15."

Examines the prominent features of the rocketpowered X-15 research aircraft flown at NASA'S Dryden Flight Research Center at Edwards Air Force Base. Briefly discusses how the X-15 was the forerunner to the space shuttle.

"The X-15 Story by Bill Dana."

NASA research pilot Bill Dana, one of the 12 pilots who flew the X-15 rocket aircraft, presents an overview of the hypersonic research program. The X-15 program has been called one of the most successful research projects in NASA history. Presentation was filmed at NASA Dryden with an audience of Dryden employees.

Publications

Elementary Math 1.

Basic math booklet featuring aeronautics and space subjects. 24 pages.

Discover Aeronautics and Space.

Coloring book introduces aeronautics and space flight. 24 pages.

Sky School.

Teacher activity booklet on aeronautics. 44 pages.

The Sky's the Limit.

Activity booklet on aeronautics. 23 pages.

History of Flight.

Activity booklet covering flight from mythology to the present. 59 pages.

Discovery.

Activity booklet on air and space flight. 76 pages.

My First NASA Wings.

Color, dot-to-dot and game booklet designed around the aircraft flown at NASA Dryden Flight Research Center.

Of Wings and Things.

Information, activities, games, model plans covering many aeronautical subjects. 85 pages.

NASA CORE (Central Operation of Resources for Educators) Lesson Plans and Activities.

Many student projects in aeronautics, astronomy, communications, space science, biology, and rocketry.

Spinoff.

Annual NASA publication about technologies developed by NASA that are used by industry and the general public to enhance the quality of life. Good for background info on space and aeronautical projects, and commercialization of technology.

Lithographs

X-33 Advanced Technology Demonstrator of the *VentureStar* Reusable Launch Vehicle. X-36 Tailless Research Aircraft.

Posters

"Commercial Transport."

Realistic drawings of commercial transport aircraft using NACA/NASA innovations. Student activities.

"General Aviation Aircraft."

Realistic drawings of general aviation aircraft using NACA/NASA innovations. Student activities.

"Practiced Here Before Landing on the Moon"

Photos of research aircraft used in support of the space program. Large, colorful poster.

"Research Aircraft."

Realistic drawings of research aircraft. Student activities.

"Tools of the Trade."

Colorful, playful drawings of 50 research aircraft. Student activities.

"Your Attitude Determines Your Altitude – Superstars of Science."

Portraits of inspirational people in the fields of aeronautics and aerospace.

Other Publications

"NASA Aircraft Cards - A game depicting aircraft of the NACA and NASA"

The scale drawings of research aircraft used in this education guide were originally developed for the NASA Aircraft Cards. Over fifty years of NACA and NASA aircraft are represented with three-view drawings, statistics, and brief descriptions of each aircraft on individual playing cards. Instructions for the card game are included with each deck, and the game can be tailored for all levels of education.

NASA Television

NASA Television (NTV) features Space Shuttle mission coverage, live special events, interactive education live shows, electronic field trips, aviation and space news, and historical NASA footage. Programming has a 3-hour block—Video (News) File, NASA Gallery, and Education File—beginning at noon Eastern and repeated three more times throughout the day.

The Education File features programming for teachers and students on science, mathematics, and technology, including *NASA...On the Cutting Edge*, a series of educational live shows.

These interactive live shows let viewers electronically explore the NASA Centers and laboratories or anywhere scientists, astronauts, and researchers are using cutting-edge aerospace technology. The series is free to registered educational institutions. The live shows and all other NASA Television programming may be taped for later use.

Live feeds preempt regularly schedules programming. Check the Internet for program listings at:

NTV Home Page:

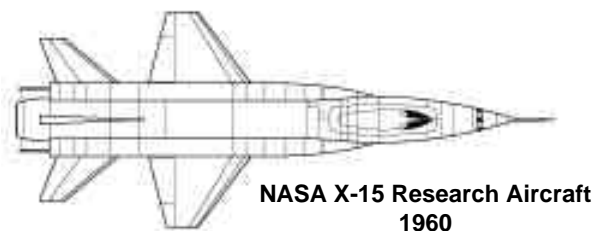
<http://www.nasa.gov/ntv>

Select "Today at NASA" and "What's New on NASA TV":

<http://www.nasa.gov>

Select "TV Schedules":

<http://spacelink.nasa.gov/NASA.News/>



On-Line Resources for Educators

NASA Education Home Page

NASA's Education Home Page serves as a cybergateway to information regarding educational programs and services offered by NASA for educators and students across the United States. This highlevel directory of information provides specific details and points of contact for all of NASA's educational efforts and Fields Center offices.

Educators and students utilizing this site will have access to a comprehensive overview of NASA's educational programs and services, along with a searchable program inventory that has cataloged NASA's educational programs.

NASA Education Home Page:

<http://www.ne.nasa.gov/education>

NASA Spacelink

NASA Spacelink is one of NASA's electronic resources specifically developed for the educational community. Spacelink is a "virtual library" in which local files and hundreds of NASA World Wide Web links are arranged in a manner familiar to educators. Using the Spacelink search engine, educators can search this virtual library to find information regardless of its location with NASA. Special events, missions, and intriguing NASA web sites are featured in Spacelink's "Hot Topics" and Cool Picks" areas.

Spacelink is the official home to electronic versions of NASA's Education Products. NASA educator guides, educational briefs, lithographs,

and other materials are cross-referenced throughout Spacelink with related topics and events. Spacelink is also host to the NASA Television Education File schedule.

Educators can learn about new NASA Educational Products by subscribing to Spacelink EXPRESS. Spacelink EXPRESS is an electronic mailing list that informs subscribers quickly by e-mail when new NASA educational publications become available on Spacelink.

Spacelink:
<http://spacelink.nasa.gov>

NASA Educational Products:
<http://spacelink.nasa.gov/products>

Learning Technologies Project

NASA's Learning Technologies Project (LTP) is an agency asset that includes a suite of Internet projects that teachers and students can use to explore NASA resource and learn about NASA missions. Through "Sharing NASA" on-line—interactive projects available from LTP's Quest server—you have the opportunity to communicate with NASA scientists and researchers and to experience the excitement of science as it is happening.

You can also find information on integrating technology into the classroom and grant opportunities. LTP offers a wide variety of educationally sound, standards-based projects that help you explore science, math, and engineering from your classroom.

The Learning Technologies Channel (LTC) allows you to participate in remote events via a multidimensional web experience. E-mail, chat rooms, audio, video, text transcription, synchronized graphics, and sometimes NASA Television are employed to take you to workshops, lectures, seminars, courses, and exciting live events around the world.

LTP Home Page:
<http://learn.lvv.nasa.gov>

List of education projects from LTP:
<http://learn.lvv.nasa.gov/ecucation/topics/education.html>

For Learning Technologies Channel information, e-mail at:
listmanager@quest.arc.nasa.gov

The following listing of Internet addresses will provide users with links to educational materials throughout the World Wide Web (WWW) related to aeronautics and aviation.

NASA Aeronautics Centers Education Home Pages:

NASA Ames Research Center
<http://ccf.arc.nasa.gov/dx>

NASA Dryden Flight Research Center
<http://trc.dfrc.nasa.gov>

NASA Langley Research Center
<http://edu.larc.nasa.gov>

NASA Lewis Research Center
<http://www.lerc.nasa.gov/WWW/PAO/html/educatn.htm>

NASA Aeronautics Photographs and Images

Dryden Flight Research Center Photo Gallery. Hundreds of photographs from the 1940's to the present depicting NACA and NASA flight research.
<http://www.dfrc.nasa.gov/gallery/photo/>

NASA Image eXchange (NIX). A web-based tool for simultaneously searching several NASA image archives on the Internet. NIX searches databases of over 300,000 on-line NASA images.
<http://nix.nasa.gov/>

NASA Multimedia Gallery. A collection of links to most of NASA on-line video, audio, and photo imagery.
<http://www.nasa.gov/gallery/index.html>

NASA Photo Gallery.

A collection of links to most of NASA still photo imagery available on-line.

<http://www.nasa.gov/gallery/photo/index.html>

Other Aeronautics Education Websites**The National Coalition for Aviation Education.**

Provides a list of over thirty member organizations and contacts, including: the Air Line Pilots Association, 4-H Aerospace Educations Programs, the Soaring Society of America, and Women in Aviation, International.

<http://www.faa.gov/region/ane/resourma/aved/natcoal.html>

The K-8 Aeronautics Internet Textbook (K8AIT).

Provides on-line lesson plans, student activities covering subjects that include the principles of aeronautics, and aerodynamics in sports technology. An aeronautics career guide, and tour of NASA projects relevant to K8AIT is also offered.

<http://wings.ucdavis.edu/>

The Aeronautics Sign Language Dictionary.

Provides 3-D animated aviators demonstrating aeronautical terms in sign language.

<http://wings.ucdavis.edu/Book/Signing/>

The Minnesota Department of Transportation, Office of Aeronautics, Aviation Education Section.

Offers a variety of aeronautical resources, including: classroom activities, links to other aviation education resources, and career information.

<http://www.dot.state.mn.us/guidebook/avied.html>

Other Aviation and Aeronautics Websites**National Air and Space Museum (NASM) - Smithsonian Institution.**

The NASM was established to memorialize the development of aviation and space flight, and provide educational materials for the study of aviation.

<http://www.nasm.si.edu/>

United States Air Force Museum Home Page.

The United States Air Force Museum near Dayton, Ohio is the oldest and largest military aviation museum in the world.

<http://www.wpafb.af.mil/museum/>

Aviation Museums of the World.

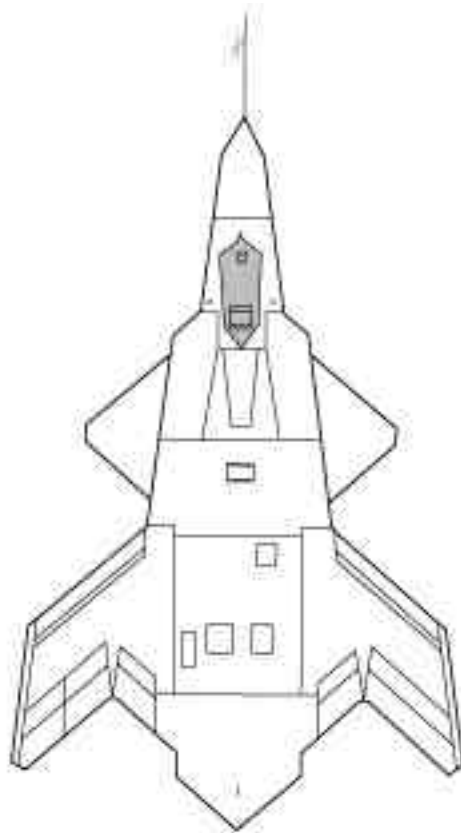
This site provides basic information, and links, to many of the major aviation museums around the world.

<http://www.geocities.com/CapeCanaveral/Lab/2789/worldmuseums.htm>

Planes of Fame Museum.

In addition to information about its collection, this aviation museum in Chino, California is an excellent source of aviation links on-line.

<http://www.planesoffame.org/links.htm>



**NASA X-36 Research Aircraft
1997**